End Lock Cylinder
Series CBA2
ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch CBA2 L □ 50 □ – 150 □ – H N

With auto switch CDBA2 L □ 50 □ – 150 □ – H N – Y7BW □

With auto switch

Mounting

B	Basic
L	Axial foot
F	Front flange
G	Rear flange
C	Single clevis
D	Double clevis
T	Center trunnion

Tube material

Nil	Aluminum tube
F*	Steel tube

* Types with auto switch are not available.

Bore size

40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	Rc
TN	NPT
TF	G

Cylinder stroke (mm)

For more information, please refer to the next page.

Lock position

H	Rear end lock
R	Front end lock
W	Double end lock

Manual release type

N	Non-lock type
L	Lock type

Auto switch

Nil	Without auto switch

* Select an applicable auto switch part number from the table below.
* D-Z7□, Z80, Y59□, Y69□, and Y7□□ are not mounted and are supplied loose. (Only the switch mounting brackets for these models are mounted.)

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Cylinder suffix

Rod boot	Nil	Without rod boot
	J	Nylon tarpaulin
	K	Heat resistant tarpaulin
Cushion	Nil	With cushion on both sides
	N	Without cushion

* When more than one symbol is to be specified, indicate them in alphabetical order.

Cylinders with built-in magnets

If built-in magnet type is ordered without auto switch, leave the field for the auto switch type blank. (Example) CDBA2L40-100-HN

Applicable Auto Switch : Refer to page 5.3 of Best Pneumatics ② for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC		Load voltage AC	Auto switch model: Tie-rod mount	Lead wire length (m)* 0.5 (Nil)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5 V	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	Z73	●	●	●	—	—	Relay, PLC
							100 V, 200 V	A54	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	A59W	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7P	●	●	○	○		
				2-wire	—	—	100 V, 200 V	J51	●	●	○	—	—	
					24 V	12 V	—	Y59B	●	●	○	○		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		Y7NW	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PW	●	●	○	○		
				2-wire		12 V		Y7BW	●	●	○	○	—	
	Water resistant (2-color indication)							Y7BA	—	●	○	○		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		F59F	●	●	○	○	IC circuit	
	Latch type with diagnostic output (2-color indication)					—		F5LF	●	●	○	○	—	
	Magnetic field resistant (2-color indication)			2-wire				P5DW	—	●	●	○		

* Lead wire length symbol 0.5 m·····Nil (Example) A54
3 m·····L (Example) A54L
5 m·····Z (Example) A54Z

* Solid state switches marked with "○" are produced upon receipt of order.

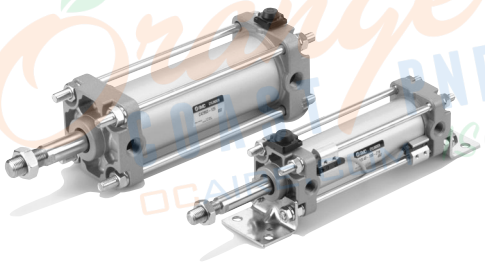
• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 15.

Maintains the cylinder's original position even if the air supply is interrupted.

When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

Same dimensions as those of the standard cylinder (Series CA2)

Non-lock and lock types are standard for manual release.



Specifications

Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Minimum operating pressure	0.15MPa*
Ambient and fluid temperature	Without auto switch: –10 to 70°C With auto switch: –10 to 60°C (With no freezing)
Piston speed	50 to 500 mm/s
Cushion	Interchangeable
Thread tolerance	JIS class 2
Stroke length tolerance	To 250 st: $^{+1.0}_{0}$ 251 to 1000 st: $^{+1.4}_{0}$ 1001 to 1500 st: $^{+1.8}_{0}$
Lubrication	Not required (Non-lube)
Mounting	Basic, Axial foot, Front flange, Rear flange Single clevis, Double clevis, Center trunnion

* 0.05 MPa except locking parts.

Lock Specifications

Lock position	Rear end, Front end, Double end				
Holding force (max.) (N)	**ø40**	**ø50**	**ø63**	**ø80**	**ø100**
	860	1340	2140	3450	5390
Backlash	2 mm or less				
Manual release	Non-lock type, Lock type				

Accessory/ For more information, please refer to page 12.

Accessory / Mounting	Standard			Option		
	Rod end nut	Clevis pin	Lock release bolt (N type only)	Single knuckle joint	Double knuckle joint (with pin)	Rod boot
Basic	●	—	●	●	●	●
Axial foot	●	—	●	●	●	●
Front flange	●	—	●	●	●	●
Rear flange	●	—	●	●	●	●
Single clevis	●	—	●	●	●	●
* Double clevis	●	●	●	●	●	●
Center trunnion	●	—	●	●	●	●

* Double clevis and double knuckle joint types are packed with pin, cotter pin and flat washer.

Made to Order

Made to Order Specifications
For more information, please refer to page 64.

	Symbol	Specifications/Contents
	—XA□	Change of rod end shape
*1	—XB5	Oversized rod
	—XB6	Heat resistant (150°C)
*1	—XC4	With heavy duty scraper
*1	—XC6	Piston rod, rod end nut made of stainless steel
	—XC7	Tie-rod, cushion valve, and tie-rod nut made of stainless steel
*1	—XC8	Adjustable stroke/Extension adjustment
*2	—XC9	Adjustable stroke/Retraction adjustment
	—XC14	Change of trunnion bracket mounting position
	—XC15	Change of tie-rod length
	—XC22	Fluoro rubber seal
	—XC27	Double clevis pin and double knuckle pin made of stainless steel
	—XC28	Compact flange made of SS400
	—XC29	Double knuckle joint with spring pin
*1	—XC35	With coil scraper

*1: For rear end lock type only
*2: For front end lock type only

Standard Stroke

Bore size (mm)	Standard stroke (mm)
40	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500
50, 63	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600
80, 100	25, 50, 75, 100, 125, 150, 175, 200, 250, 300, 350, 400, 450, 500, 600, 700

* Types with auto switch have different minimum strokes. Please refer to page 13.

Rod Boot Material

Symbol	Rod boot materials	Max. ambient temperature
J	Nylon tarpaulin	70°C
K	Neoprene cross	110°C*

* Maximum ambient temperature for the rod boot itself.

Minimum Stroke for Auto Switch Mounting

⚠ Caution

①**The minimum stroke for mounting varies with the auto switch type and mounting type of the cylinder. In particular, the center trunnion type needs careful attention.** (For more information, please refer to page 13.)

Weight/Aluminum Tube (Steel tube)

(kg)

Bore size (mm)		40	50	63	80	100
Basic weight	Basic	0.89 (0.94)	1.36 (1.40)	2.00 (2.04)	3.48 (3.63)	4.87 (5.07)
	Axial foot	1.08 (1.13)	1.58 (1.62)	2.34 (2.38)	4.15 (4.30)	5.86 (6.06)
	Flange	1.26 (1.30)	1.81 (1.86)	2.79 (2.84)	4.93 (5.08)	6.79 (6.99)
	Single clevis	1.12 (1.17)	1.70 (1.74)	2.63 (2.67)	4.59 (4.74)	6.65 (6.86)
	Double clevis	1.16 (1.21)	1.79 (1.84)	2.79 (2.83)	4.88 (5.03)	7.17 (7.38)
	Trunnion	1.25 (1.35)	1.84 (1.94)	2.80 (3.00)	5.03 (5.32)	7.15 (7.54)
Additional weight by each 50 mm stroke	All mounting brackets (except for steel tube trunnion)	0.22 (0.28)	0.28 (0.35)	0.37 (0.43)	0.52 (0.70)	0.65 (0.87)
	Steel tube trunnion	(0.36)	(0.46)	(0.65)	(0.86)	(1.07)
Accessory	Single knuckle	0.23	0.26	0.26	0.60	0.83
	Double knuckle (with pin)	0.37	0.43	0.43	0.87	1.27

* Values inside the parentheses are those for the steel tube type.

Lock Unit Additional Weight

(kg)

Bore size (mm)		40	50	63	80	100
Manual release Non-lock type (N)	Rear end lock (H)	0.02	0.03	0.03	0.10	0.12
	Front end lock (R)	0.02	0.02	0.02	0.07	0.06
	Double end lock (W)	0.04	0.05	0.05	0.17	0.18
Manual release lock type (L)	Rear end lock (H)	0.04	0.05	0.05	0.13	0.15
	Front end lock (R)	0.04	0.04	0.04	0.10	0.09
	Double end lock (W)	0.08	0.09	0.09	0.23	0.24

Calculation example: **CBA2L40-100-HN**

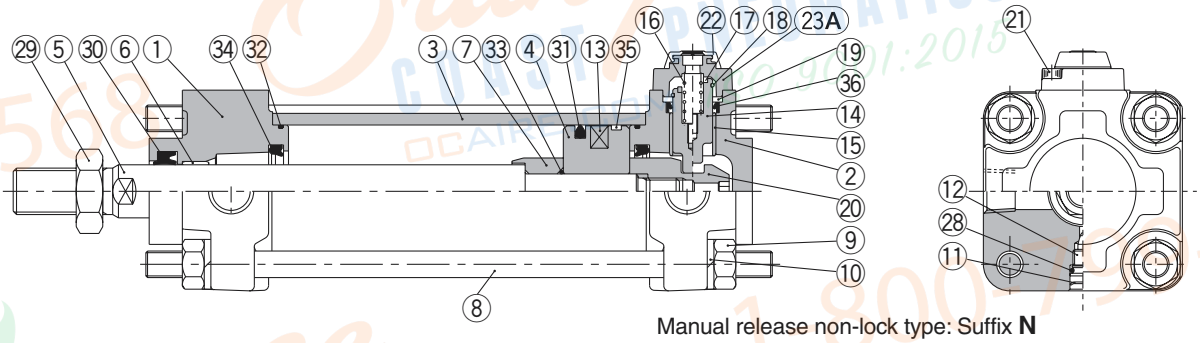
- Basic weight ..... 1.08kg (ø40 foot type)
- Additional weight ... 0.22/50 st
- Cylinder stroke ..... 100 st
- Lock weight ..... 0.02 kg (Rear end lock, Manual release, Non-lock)

1.08 + 0.22 x 100/50 + 0.02 = 1.54 kg

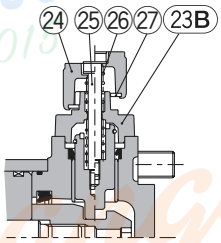
The minimum stroke for auto switch mounting, proper auto switch mounting position and height, operating range, applicable auto switches, auto switch mounting brackets and their part numbers, and bracket part numbers are the same as those for the double acting single rod type of Series CA2.

Construction

Rear end lock



Manual release non-lock type: Suffix **N**



Manual release lock type: Suffix **L**

Parts List

No.	Description	Material	Note
1	**Rod cover**	Aluminum casting	Metallic painted
2	**Head cover**	Aluminum casting	Metallic painted
3	**Cylinder tube**	Aluminum alloy	Hard anodized
4	**Piston**	Aluminum alloy	Chromated
5	**Piston rod**	Carbon steel	Hard chromium electroplated
6	**Bushing**	Lead-bronze casting	
7	**Cushion ring A**	Rolled steel	Electroless nickel plated
8	**Tie-rod**	Carbon steel	Corrosion resistant chromated
9	**Tie-rod nut**	Rolled steel	Nickel plated
10	**Spring washer**	Steel wire	Chromated
11	**Snap ring**	Spring steel	
12	**Cushion valve**	Steel wire	Nickel plated
13	**Rubber magnet***	NBR	With auto switch*
14	**Lock piston**	Carbon steel	Quench hard chrome plated
15	**Lock bushing**	Lead-bronze casting	
16	**Lock spring**	Stainless steel	
17	**Bumper**	Urethane	
18	**C-ring**	Steel wire	Zinc chromated
19	**Seal retainer**	Rolled steel	Zinc chromated
20	**Cushion ring nut**	Chromium molybdenum steel	Quench hard chrome plated
21	**Hexagon socket head cap screw**	Chromium molybdenum steel	Black zinc chromated
22	**Rubber cap**	Chloroprene rubber	
23A	**Cap A**	Aluminum casting	Black coated
23B	**Cap B**	Carbon steel	Black coated, Tufftride

No.	Description	Material	Note
24	**M/O knob**	Die-cast zinc	Black coated
25	**M/O bolt**	Chromium molybdenum steel	Black zinc chromated
26	**M/O spring**	Steel wire	Zinc chromated
27	**Stopper ring**	Carbon steel	Zinc chromated
28	**Cushion valve seal**	NBR	
29	**Rod end nut**	Rolled steel	Nickel plated
30	**Rod seal**	NBR	
31	**Piston seal**	NBR	
32	**Cylinder tube gasket**	NBR	
33	**Piston gasket**	NBR	
34	**Cushion seal**	NBR	
35	**Wear ring**	Resin	
36	**Lock piston seal**	NBR	

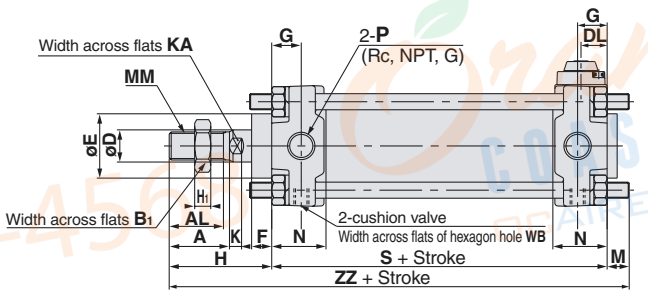
Replacement Parts / Seal Kits

Bore size (mm)	Seal kit No.		Content
	Single end lock	Double end lock	
40	MBB40-PS	MBB40-PS-W	Consists of numbers ㉚, ㉛, ㉜, ㉞, and ㊱ above.
50	MBB50-PS	MBB50-PS-W	
63	MBB63-PS	MBB63-PS-W	
80	MBB80-PS	MBB80-PS-W	
100	MBB100-PS	MBB100-PS-W	

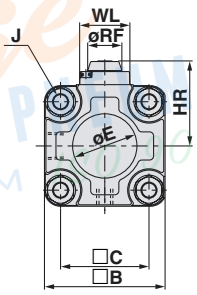
The seal kits consist of items ㉚, ㉛, ㉜, ㉞ and ㊱.
Please order them by using the seal kit number corresponding to each bore size.

Basic (Dimensions are common to rear end lock, front end lock and double end lock types.)

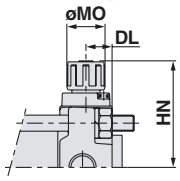
Rear end lock: CBA2B Bore size – Stroke -HN



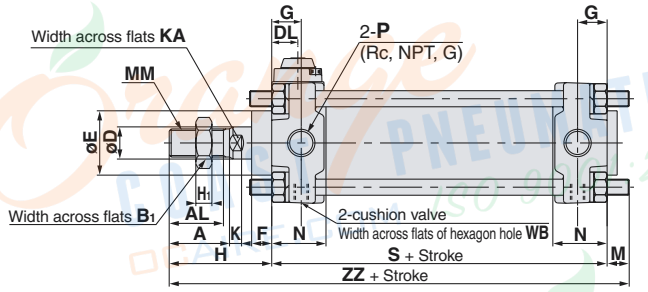
Manual release (non-lock type)
: Suffix **N**



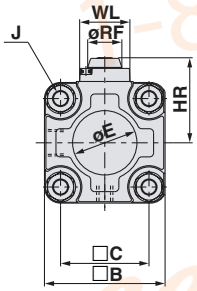
Manual release (lock type)
: Suffix **L**



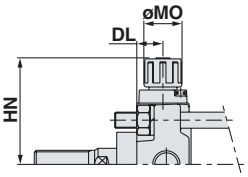
Front lock: CBA2B Bore size – Stroke -RN



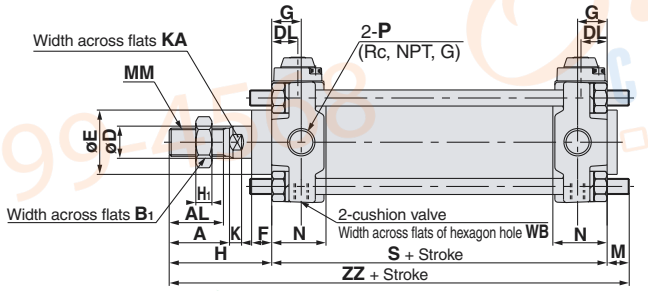
Manual release (non-lock type)
: Suffix **N**



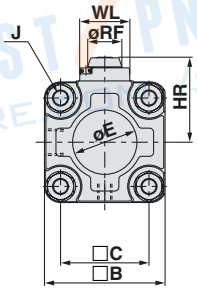
Manual release (lock type)
: Suffix **L**



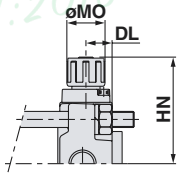
Double lock: CBA2B Bore size – Stroke -WN



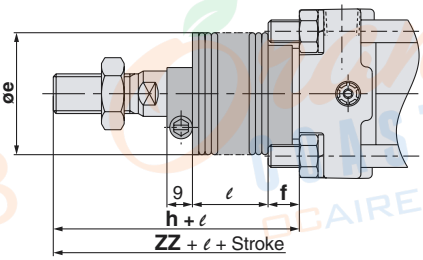
Manual release (non-lock type)
: Suffix **N**



Manual release (lock type)
: Suffix **L**



With rod boot



(mm)

Bore size (mm)	Stroke range	A	AL	□B	B1	□C	D	DL	E	F	G	H	H1	HR	HN (MAX)	J	K	KA	M	MM	MO	N	P	RF	S	WB	WL	ZZ
40	up to 500	30	27	60	22	44	16	13	32	10	15	51	8	42.3	56	M8 x 1.25	6	14	11	M14 x 1.5	19	27	1/4	17	84	2.5	25	146
50	up to 600	35	32	70	27	52	20	13	40	12	17	58	11	47.3	61	M8 x 1.25	7	18	11	M18 x 1.5	19	30	3/8	17	90	2.5	25	159
63	up to 600	35	32	85	27	64	20	15.5	40	10	17	58	11	54.8	68.5	M10 x 1.25	7	18	14	M18 x 1.5	19	31	3/8	17	98	4	25	170
80	up to 750	40	37	102	32	78	25	18.5	52	14	21	71	13	65.8	80.5	M12 x 1.75	11	22	17	M22 x 1.5	23	37	1/2	21	116	4	40	204
100	up to 750	40	37	116	41	92	30	20	52	14	21	72	16	72.8	87.5	M12 x 1.75	11	26	17	M26 x 1.5	23	40	1/2	21	126	4	40	215

* For more information about the rod end nut and accessories, please refer to page 12.

With Rod Boot

Bore size (mm)	Stroke range (mm)	e	f	h	ℓ	ZZ
40	20 to 500	43	11.2	59	1/4 stroke	154
50	20 to 600	52	11.2	66	1/4 stroke	167
63	20 to 600	52	11.2	66	1/4 stroke	178
80	20 to 750	65	12.5	80	1/4 stroke	213
100	20 to 750	65	14	81	1/4 stroke	224

Dimensions of the mounting brackets are the same as those of the standard double acting single rod type. Please refer to pages 7 to 10.

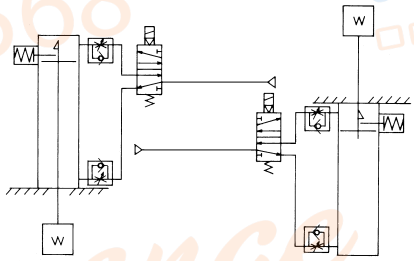
⚠ Specific Product Precautions

Be sure to read before handling. Please refer to pages 72 to 79 for safety instructions and common precautions.

Use the Recommended Pneumatic Circuit.

⚠ Caution

They are required to engage and disengage the locks correctly.



Rear end lock　　Front end lock

Operation

⚠ Caution

①**Do not use a 3 position solenoid valve.**
Avoid using this cylinder in combination with a 3 position solenoid valve (particularly the closed center metal seal type). If air pressure becomes sealed inside the port on the side that contains the lock mechanism, the lock will not engage. Even if the lock is engaged at first, the air that leaks from the solenoid valve could enter the cylinder and cause the lock to disengage as time elapses.

②**Back pressure is required when releasing the lock.**
Before starting, make sure that air is supplied to the side that is not equipped with a lock mechanism as shown in the diagram above (or the side on which the piston rod is unlocked, if both sides are equipped with a lock). Otherwise, the lock may not disengage.

③**Release the lock when mounting or adjusting the cylinder.**
The lock may not disengage if the cylinder is installed with its lock engaged.

④**Operate with a load ratio of 50% or less.**
The lock may not disengage or may become damaged if the load exceeds 50%.

⑤**Do not operate multiple synchronized cylinders.**
Avoid applications in which two or more end lock cylinders are synchronized to move one work piece, as one of the cylinder locks may not be disengaged when required.

⑥**Use a speed controller with meter-out control.**
If operated under meter-in control, the lock may not disengage.

⑦**Be sure to operate completely to the cylinder stroke end on the side with the lock.**
The lock may not engage or disengage if the piston in the cylinder has not reached the stroke end.

Operating Pressure

⚠ Caution

①Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

Exhaust Speed

⚠ Caution

①When the pressure on the side with the lock mechanism drops to 0.05 MPa or below, the lock engages automatically. If the piping on the side with the lock mechanism is thin and long, or if the speed controller is away from the cylinder port, the lock engagement may take some due to decline of the exhaust speed. The same result will be caused by clogging of the silencer installed at the EXH port of the solenoid valve.

Relation to Cushion

⚠ Caution

①When the cushion valve on the side with the lock mechanism is fully closed or almost closed, the piston rod may not be able to reach the stroke end, resulting in lock engagement failure. Furthermore, if the lock becomes engaged while the cushion valve is almost fully closed, it may become impossible to be disengaged. Therefore, the cushion valve must be adjusted properly.

Releasing the Lock

⚠ Caution

①To disengage the lock, make sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended air pressure circuit.) If the lock is disengaged, while the port on the side without a lock mechanism is in the exhausted state and the load is being applied to the lock mechanism, undue force may be applied to the lock mechanism, causing the lock mechanism to be damaged. Also, it could be extremely dangerous, because the piston rod could move suddenly.

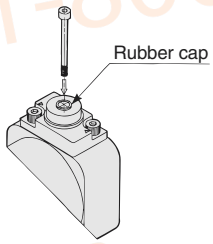
Manual Release

⚠ Caution

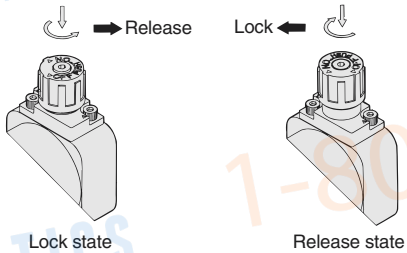
①**Non-lock type manual release**
Insert the bolt, which is provided as an accessory part, through the rubber cap (it is not necessary to remove the rubber cap). Screw the bolt into the lock piston and pull the bolt to disengage the lock. Releasing the bolt will re-engage the lock.
The bolt size, pulling force, and the stroke are listed below.

Bore size (mm)	Thread size	Pulling force	Stroke (mm)
40, 50, 63	M3 x 0.5 x 30ℓ or more	10N	3
80, 100	M5 x 0.8 x 40ℓor more	24.5N	3

* Remove the bolt for normal operation.
* It can cause lock malfunction or faulty release.



②**Manual release lock type**
Push the M/O knob and turn it 90° counterclockwise. The lock disengages when the ▲ mark on the cap is aligned with the ▼ OFF mark on the M/O knob (and the lock will remain disengaged).
To engage the lock, push the M/O knob all the way in and turn it 90° clockwise to align the ▲ mark on the cap with the ▼ ON mark on the M/O knob. At this time, make sure that the knob stops by clicking into place.
Failure to click it into place properly can cause the lock to disengage.



Lock state　　Release state